Accelerator Operations

User Program

Accelerator Operations

Maintenance and enhancement activities were performed during the Los Alamos Neutron Science Center (LANSCE) User Facility regularly scheduled outage from January–April 2001. This outage was followed by accelerator turn-on and contingency time that culminated in the start of user-facility operations on July 1, 2001. Operations continued through December 24 when the facility turned off for the scheduled 2002 outage.

2001 Run Cycle Planning

A detailed 2001 outage was planned during the last quarter of 2000 to both coordinate and level personnel resources across the major tasks selected for the outage. This sound planning, together with prudent execution by the LANSCE Operations Team, allowed the user facility turn-on to begin as scheduled on April 30, 2001. This was followed by scheduled user-facility operations that began on July 1. Key tasks that were completed included

- construction of an Isotope Production Facility (IPF) shield wall to de-couple the remaining civil construction for this facility from accelerator operations;
- modification of the transition region for IPF and installation of a portion of the IPF beam line in the accelerator tunnel;
- installation of water-distribution piping and connection and commissioning of the new accelerator cooling tower;
- essential, high-priority accelerator and facility maintenance;
- preparation of an Interim Safety Assessment Document for the LANSCE User Facility accelerator complex, excluding the Lujan Target Nuclear Facility; and
- successful accelerator turn-on.

The outage was managed as a project subject to formal change control with 79 change requests processed during the course of the outage. Over 800 activities identified as Priority 1 (those activities absolutely necessary to resume operation of the user facility) were completed, together with about 600 lower-priority activities. These tasks, together with those under consideration for future outages, are shown in the long-range schedule presented in Fig. 1. This schedule was developed as part of an integral effort to formalize long-range planning to make facility operations and outages more predictable.

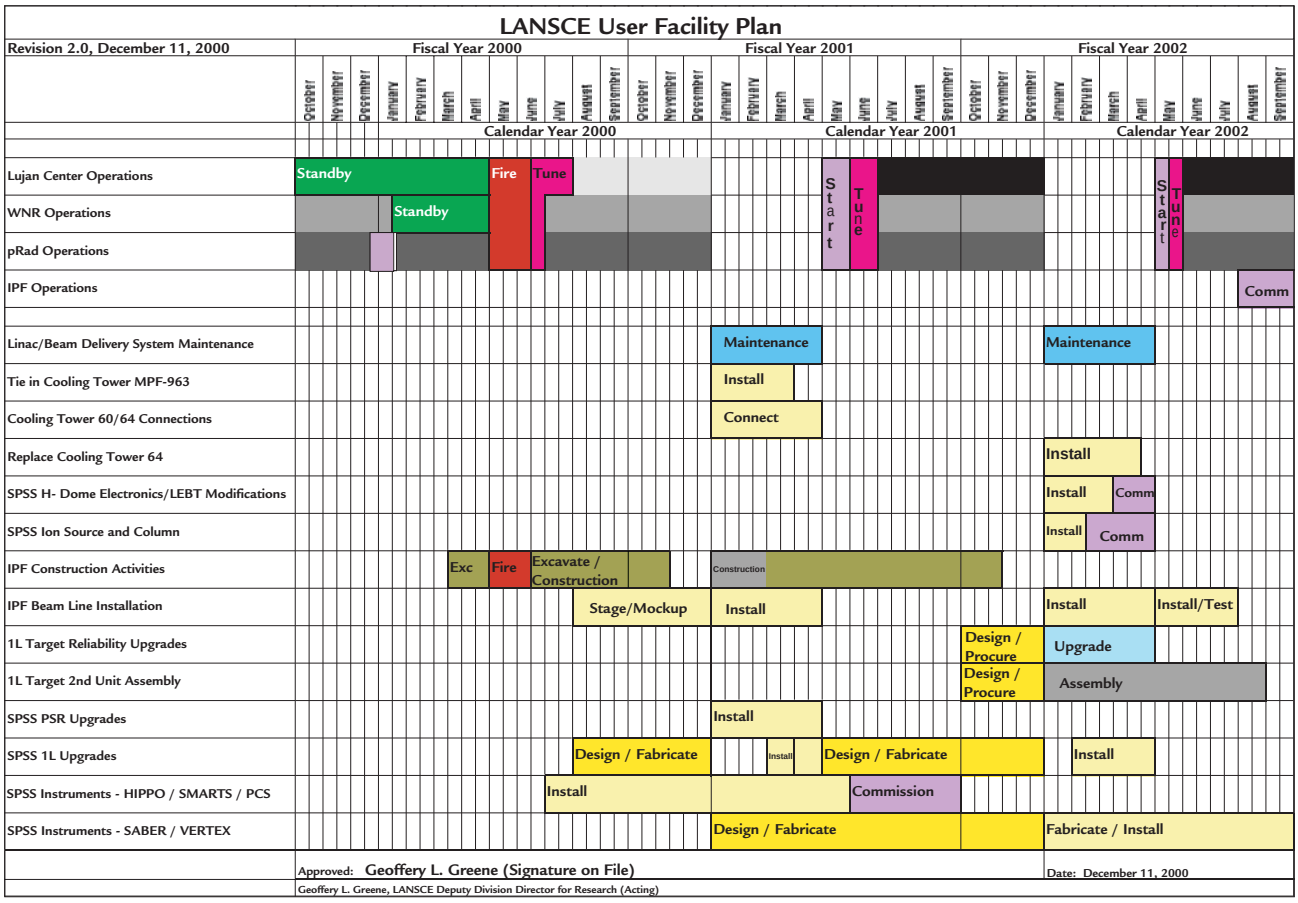
LANSCE management developed a more predictable schedule for calendar year (CY) 2001 for user-facility operations for proton radiography (pRad) and for Neutron Resonance Spectroscopy (NRS) and other irradiation activities that use the Proton Storage Ring (PSR) beam at the Weapons Neutron Research Facility (WNR) Target 2. This schedule is shown in Fig. 2. A key element of this schedule was the definition and inclusion of blocks of time identified for "sole-use" activities. Sole-use activities are defined as any research and development use of the LANSCE accelerator that precludes or interferes with beam delivery to the Lujan Neutron Scattering Center (Lujan Center) or with linear-accelerator (linac) beam delivery to WNR.

The 28-day periodicity of the schedule was built around the expected lifetime of the ion source used to generate the H^- ion beam used for all experimental programs. This schedule allowed experiments that lost significant time earlier in the operating period to be rescheduled and did indeed provide more predictable operation, but several concerns were identified. Chief among these was that the experimental programs at the Lujan Center and WNR always began on a Saturday. The operating schedule for 2002 will be restructured to alleviate this concern but will retain the same 28-day periodicity.

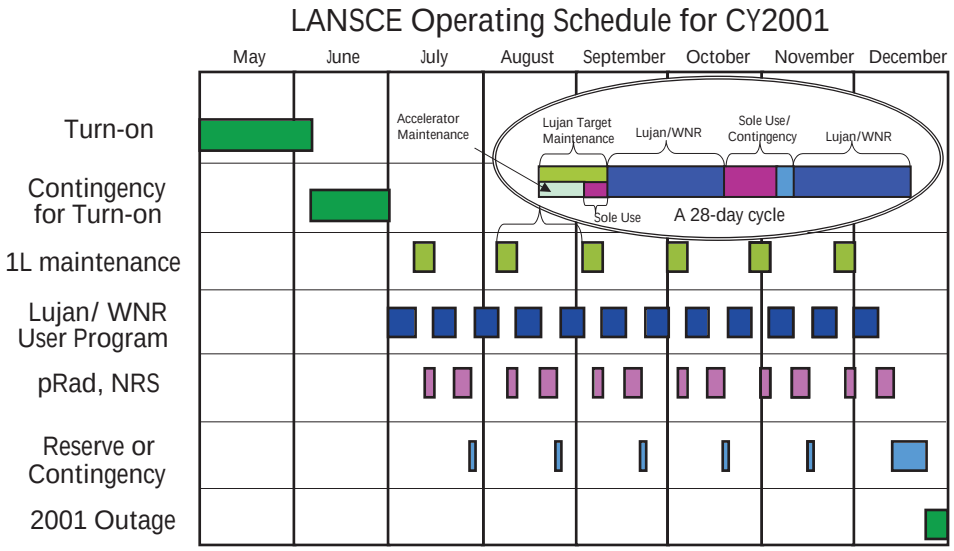
Lujan Center Target-Moderator-Reflector System

The two most significant operational difficulties encountered in 2001 occurred in the Lujan Center target-moderator-reflector system (TMRS). The complicated TMRS assembly is shown in Fig. 3.

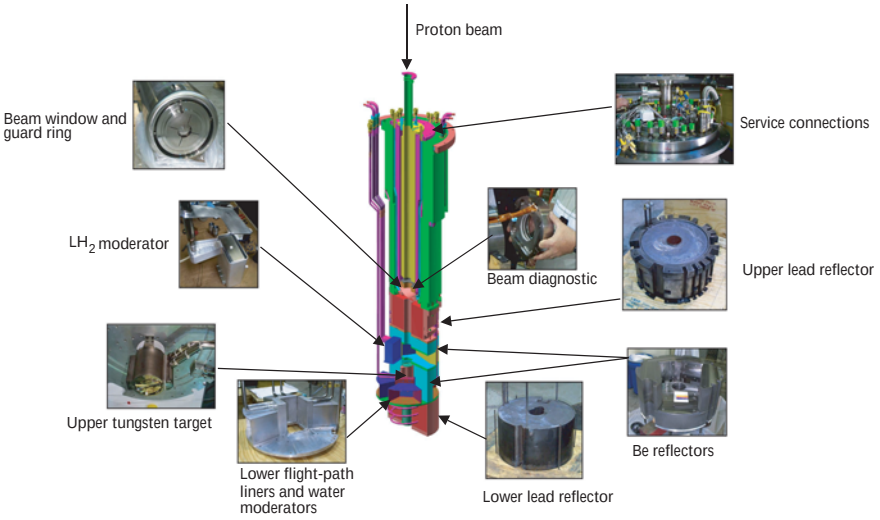
The first problem, overheating of the lower-lead-reflector component, was identified in late June after initial turn-on and operation at 100 ∝A. Beam current was first reduced to 75 ∝A to allow study of the phenomenon until the scheduled maintenance days on July 9, 2001. Beam delivery was resumed on July 14, and the beam current was slowly raised to about 65 ∝A. Several experiments were conducted. The most meaningful results were obtained by measuring the rate of cooling of the lead assembly. These and other measurements led to the conclusion that the bulk lead material had separated from the stainless steel cooling coils embedded in the lead. Thermal modeling of the assembly demonstrated that operation at beam currents greater than ~ 60 ∝A might result in partial melting of the lead reflector. After careful review of the information, operation of the Lujan Center was continued at a beam current of 55 ∝A for the remainder of the operating period.



↑ ***Fig. 1.*** *The LANSCE User Facility plan, December 11, 2000.*



↑ ***Fig. 2.*** *Block schedule for LANSCE User Facility operation in CY2001. Each 28-day cycle began with a three-day maintenance period for the entire facility and a two-day sole-use period for pRad in parallel with two additional maintenance days for the Lujan Center target.*



↑ ***Fig. 3.*** *The Lujan Center TMRS.*

Careful monitoring of assembly temperatures over the operating period demonstrated that the appropriate margin with respect to the melting point of lead was maintained.

The second problem, a reduction of the cooling water flow across the tungsten plates of the upper-target assembly, was identified during a maintenance outage in early October. The problem was identified through trending of the flow constant for the upper target, a parameter determined from system pressure and flow rates. Analysis of the data indicated that the most likely cause of the reduced flow was a cracked weld between the inlet and outlet plena of the upper-target cooling system. The crack could allow water to shunt directly from the inlet to the outlet without passing over the tungsten plates. Analysis indicated that operation at 55 ∝A was well within the limits imposed by the reduced-plate-cooling capacity. Because the flow rate across the plates is a key *Limiting Condition of Operation* for the TMRS, authorization from the Department of Energy Office of Los Alamos Site Operations (DOE/OLASO) was necessary before operation of the Lujan Center could resume. The necessary analysis and documentation was completed and monitoring procedures implemented to allow the restart of beam with a loss of less than four days of scheduled operation. This lost time was made up in the contingency time at the end of the operating period.

A project to make the necessary engineering design changes and fabricate and assemble a new TMRS assembly was established. This plan included an aggressive schedule in response to the two failures described above, and it was identified as the highest-priority task for the CY2002 outage.

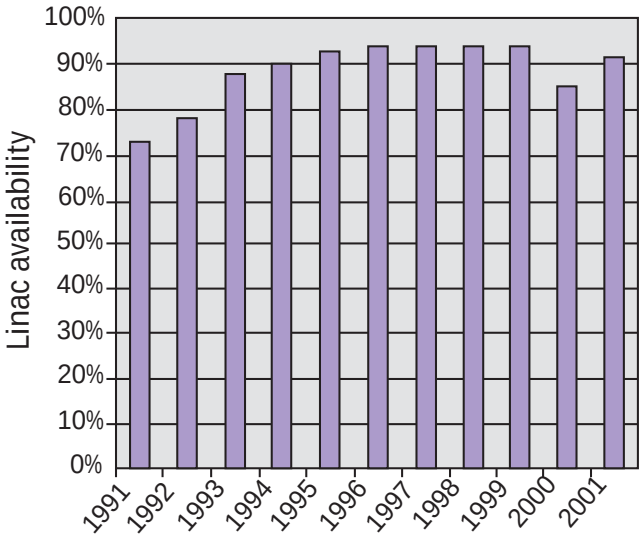
2001 Operations and Beam Delivery

The successful completion of the outage work and efficient accelerator restart combined to make available to the experimental programs the 24 days of contingency time from the outage schedule. This permitted the early delivery of beam for the Lujan Center, WNR Target 2, and pRad experiments. In particular, the pRad program was able to make an early start on dynamic experiments, and the instruments at the Lujan Center were able to complete standard start-up activities in advance of the start of the User Program on July 1, 2001. In all, 79 hours of additional beam was delivered to pRad, 33 hours to WNR Target 2, and 242 hours to the Lujan Center.

Despite the necessity to operate the Lujan Center at a reduced beam current of 55 ∝A, the entire LANSCE User Facility achieved unparalleled levels of beam availability in 2001. Our commitment was to deliver beam to all four active target stations for a 6-month operating period from July 1 to December 24, 2001, and the operational achievements are summarized in Figs. 4-7.

The LANSCE Operations Team performed very well in 2001 by completing the scheduled outage in a timely way and delivering beam to all experimental areas with availability against schedule in excess of 90%. This allowed the User Facility to host over 200 experiments at Lujan Center and WNR with just under 600 users served. The pRad program continued the tradition of perfect beam availability for dynamic experiments. A total of 36 dynamic experiments were performed in 2001, bringing the total number of such experiments for which beam has been delivered when requested to over 114.

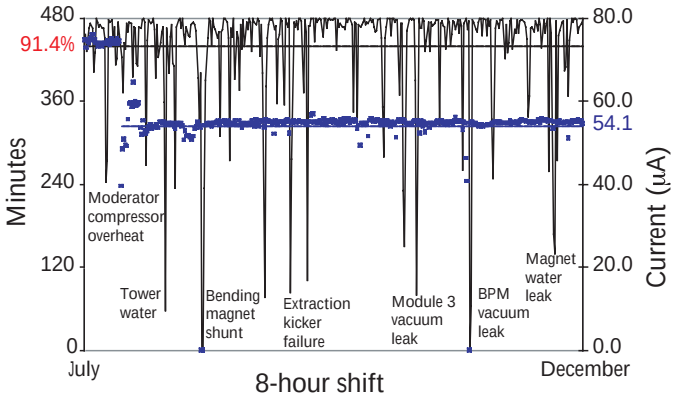
Another important metric for LANSCE operations is the fraction of scheduled time lost for downtimes greater than 8 hours. Performance in prior years led management to establish a goal of 15% for this metric in 2001. The fraction of scheduled time lost for downtimes greater than eight hours was 1.7% for the Lujan Center and 1.1% for WNR Target 4, substantially better than the goal.



↑ ***Fig. 4.*** *Linac availability by calendar year.*

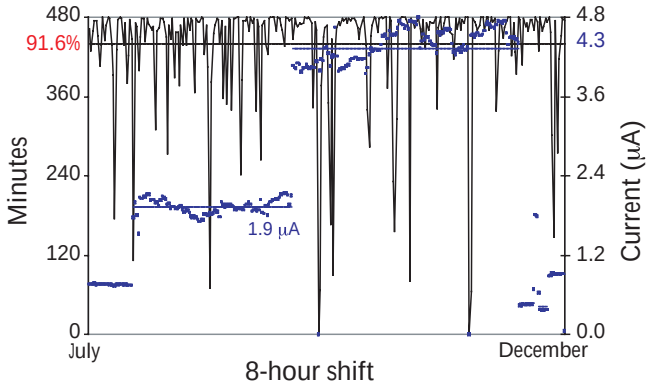
Area	Operating Period	Hours Scheduled	Hours Delivered	Availability
Lujan Center	07/01-12/24	2734.8	2498.7	91.4%
WNR Target 4	07/01-12/17	2171.9	1989.4	91.6%
Line X/B/C	07/12-12/20	411.0	386.9	94.1%
WNR Target 2	07/15-12/23	328.7	317.1	96.5%

↑ ***Fig. 5.*** *LANSCE User Facility operational summary for 2001.*



↑ ***Fig. 6.*** *Lujan Center beam delivery performance for 2001.*

Certain maintenance actions were taken during the 2001 outage in an attempt to address significant causes of downtime in 2000. A newly installed air eliminator system for the TMRS target water system eliminated the necessity for daily beam-off periods of about 20 minutes to vent dissolved gasses that accumulate in this system during beam operation. New capacitors



↑ ***Fig. 7.*** *WNR Target 4 beam delivery performance for 2001.*

procured in 2000 were not delivered in time for testing and installation in the high-voltage capacitor rooms used to stabilize the klystron voltages in the accelerator radio-frequency power systems. Nevertheless, the maintenance personnel carefully evaluated the existing capacitors, removed weak units, and organized these older capacitors into like groupings. The result was only a single capacitor failure during the entire operating period. Credit should also be given to more conservative scheduling of accelerator-duty-factor changes based on the lessons learned in CY2000.

2002 Outage Planning

Planning for the 2002 outage began in the fall of 2001. Key tasks included in the schedule are as follows:

- fabricate, assemble, install, and test the Mark II Lujan Center TMRS;
- install the remaining IPF beam-line components in the main accelerator tunnel;
- perform essential (Priority 1) accelerator and facility maintenance, including connection of the new cooling tower;
- develop planned Authorization Basis documentation;
- procure, fabricate, and test components for the Switchyard Kicker system; and
- perform experimental-area activities and Priority 2 and 3 accelerator and facility maintenance, including demolition of the obsolete cooling towers.

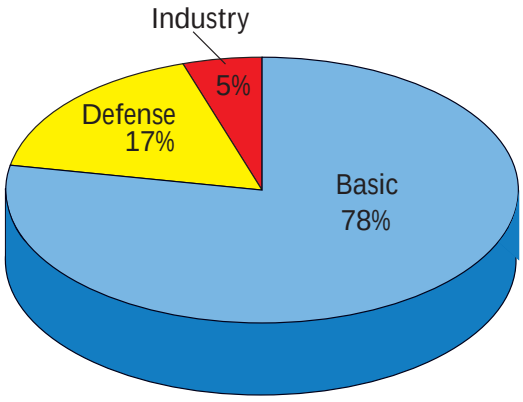
The installation of the Switchyard Kicker system is planned for the 2003 outage. The Switchyard Kicker system will remove the necessity for sole-use operation

when delivering beam to Areas B and C. This will result in a 5-fold increase in beam time available for pRad and a 25% increase in beam time available to the Lujan Center and WNR Target 4 in a given operating period.

User Program

The major portion of funding for LANSCE is provided by the Department of Energy (DOE) National Nuclear Security Administration (NNSA) Defense Programs (DP), which uses LANSCE in support of its Stockpile Stewardship mission to ensure that U.S. nuclear weapons remain safe, secure, and reliable without nuclear testing. The obvious synergy between the DP uses of LANSCE and the areas of basic research that have traditionally used reactor or spallation neutron sources, particularly in the area of condensed-matter science, has led to an alliance between DP and the DOE Office of Basic Energy Sciences (BES) to support and use LANSCE. BES provides funding for a National User Program at the Lujan Center that attracts scientists in various disciplines who use neutron scattering in support of their research. The synergy between DP and BES allows scientists from different institutions to perform defense, basic, and industrial research at LANSCE (Fig. 8).

Experiments at the Lujan Center and the WNR are selected on the basis of proposals that are peer reviewed by the appropriate subcommittee of our Program Advisory Committee (PAC). By charter, members of the PAC (Fig. 9) are selected by LANSCE management for a three-year term on the basis of recommendations by the LANSCE User Group (LUG) through its Executive Committee and Los Alamos National Laboratory (LANL) management.



↑ ***Fig. 8.*** *Distribution of experiments run during 2001. A portion of basic-research experiments can have both defense and/or industrial applications as well.*

Experiments at the Lujan Center or WNR that involve either results that are publishable in the open literature or support the DOE's Stockpile Stewardship mission receive beam time at no cost to the user. Beam time for proprietary work can be purchased by a special user agreement under DOE's full-cost recovery rules.

Supporting Student Research

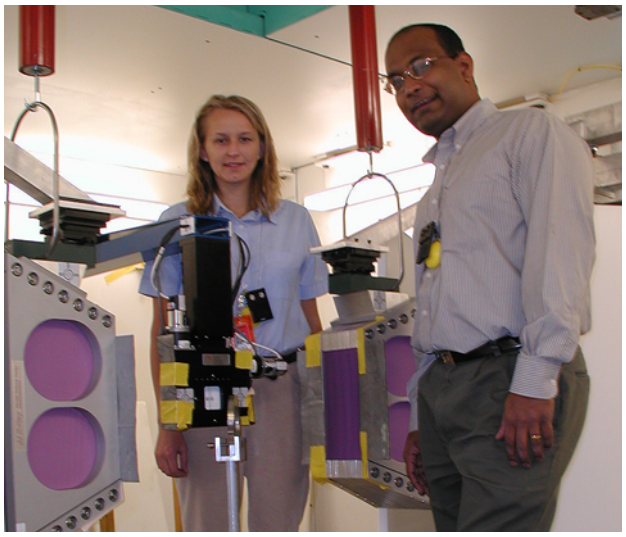
LANSCE recognizes that it has a key role to play in science education. Students and postdoctoral fellows learn from and contribute to the research at LANSCE in various ways. Three theses based in whole or in part on research conducted at LANSCE facilities were completed during 2001. A list of these can be found in the publications section on page 204.

LANSCE takes great pride in serving as a training ground for undergraduate and graduate students in the use of neutron-scattering techniques (Fig. 10). During the 2001 run cycle, the user facility saw a record number of students coming to participate in experimental work. Fifty percent of our users were under age 40, with 23% being graduate students, 6% undergraduates, and 9% postdoctoral associates. Additionally, many students spend summer months as LANL employees working at the Lujan Center and WNR, usually at the recommendation of their thesis advisor. Students are paid a salary during their tenure. More information on student employment programs can be obtained from LANL's Human Resources web site at www.hr.lanl.gov/Students/.

The new STONE (Student Travel Opportunities for Neutron Experiments) program, aimed at broadening the user community, increasing access to instruments to students and faculty, and providing training to new student users in neutron-scattering techniques, provided support to 15 students during the 2001 run cycle. Through LANL's University of California Directed Research and Development Office and LANSCE, funds to help offset travel expenses are available to students coming to conduct neutron-scattering experiments. These funds are for students who have been allocated beam time as part of an approved experimental team. A portion of the funds is restricted to University of California and New Mexico university/college students, whereas funds provided by LANSCE are available to all students. In addition to monies, LANSCE staff members provide students with training on the use of the spectrometers and assist in experimental setup and data analysis. This high level of technical support allows professors the flexibility to bring, or send, students to conduct experiments without a high impact on their research budget.

Elastic Subcommittee	Inelastic Subcommittee	Large-Scale Subcommittee
Dimitri Argyriou, Chair (2) Argonne National Laboratory	Meigan Aronson (2) University of Michigan	Shenda Baker (2) Harvey Mudd College
Despo Louca (2) University of Virginia	Brent Fultz (2) California Institute of Technology	Gian Felcher (2) Argonne National Laboratory
James Richardson (2) Argonne National Laboratory	Kenneth Herwig (2) Argonne National Laboratory	Mike Fitzsimmons (2) Los Alamos National Laboratory
Thomas Proffen (1) Los Alamos National Laboratory	Marie-Louise Saboungi (2) Argonne National Laboratory	William Hamilton, Chair (2) Oak Ridge National Laboratory
Andy Winholtz (2) University of Missouri	Dan Neumann (2) National Institute of Standards and Technology	Seth Fraden (1) Brandeis University
Thomas Koetzle (2) Brookhaven National Laboratory (retired)	Frans Trouw (1) Los Alamos National Laboratory	Thomas Rieker (2) Corning Inc.
Defense-Related Materials Science Subcommittee	**Defense-Related Nuclear Science Subcommitte**	**Basic Nuclear and Particle Physics Subcommittee**
Kathi Alexander (1) Los Alamos National Laboratory	Paul Bradley (3) Los Alamos National Laboratory	Jolie Cizewski (3) Rutgers University
Brad Clements (1) Los Alamos National Laboratory	Jolie Cizewski (3) Rutgers University	Ben Gibson (2) Los Alamos National Laboratory
Brent Fultz (2) California Institute of Technology	Anna Hayes, Chair (2) Los Alamos National Laboratory	Chris Gould, Chair (2) North Carolina State University
Wil Gauster, Chair (1) Sandia National Laboratories	Bob Little (sub) Los Alamos National Laboratory	Anna Hayes (2) Los Alamos National Laboratory
Christian Mailhiot (1) LLNL/Department of Energy	Mohammed Mustafa (3) Lawrence Livermore National Laboratory	Scott Wissink (1) Indiana University
Alan Patterson (2) Los Alamos National Laboratory	John Sarracino (1) Los Alamos National Laboratory	Steve Yates (1) Department of Chemistry
Steve Sterbenz (advisory/non-voting) Los Alamos National Laboratory	Mark Stoyer (1) Lawrence Livermore National Laboratory	
Bob Von Dreele (advisory/non-voting) Los Alamos National Laboratory	W. Scott Wilburn (1) Los Alamos National Laboratory	
Nuclear Technology Subcommittee		
Rick Anderson, Chair (2) Los Alamos National Laboratory	Chris Gould (2) North Carolina State University	Mark Stoyer (1) Lawrence Livermore National Laboratory
Ben Gibson (2) Los Alamos National Laboratory	Eric Pitcher (sub) Los Alamos National Laboratory	

↑ ***Fig. 9.*** *2001 LANSCE PAC members. The numbers in parentheses indicate year on committee; members typically serve three-year terms with chairpersonship rotating annually.*



↑ ***Fig. 10.*** *Husband and wife team, Cecilia Larson and Raj Vaidyanathan, came to the Lujan Center to do experiments on NPD and SMARTS last run cycle. Cecilia is currently enrolled in a Ph.D. program at the University of Linkoping, Sweden, and Raj is a Professor at the University of Central Florida.*

Experiment Reports

Reports describing the work conducted are required for all experiments performed at the Lujan Center or WNR three months following collection of data. Experiment Reports from 2001 are included on the CD in the inside back cover of this report. Past reports can be obtained by contacting the LANSCE User Office, 505-665-1010 or lansce_users@lanl.gov.

The LANSCE User Office

The LANSCE User Office has the central role for administering the user program and for user reception.

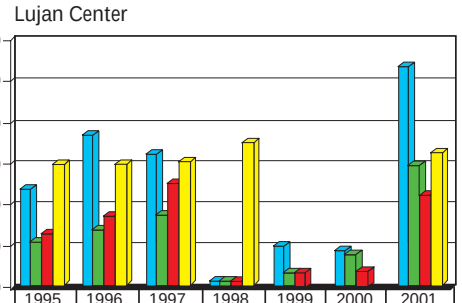
The 2001 run cycle was a record year for the User Office (Figs. 11-12), with staff processing over 200 proposals and providing support for just under 600 user visits—all with one less person than during the 1997 run cycle! User Office staff (Fig. 13) assist users with their visit, including travel and training arrangements; administer the proposal, review, and scheduling processes; improve processes for user access, orientation, training, and services; communicate beam-schedule information; support conferences and workshops, the LUG, and other committees integral to the user program; organize and support the Annual User Meeting; collect and report statistical information; assess and report user satisfaction; arrange student funding support; coordinate user/visitor communications; provide reception for all visitors and users to the facility; and arrange tours.

The Face of the Users

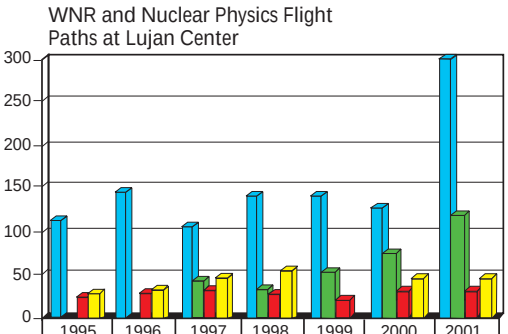
The 2001 run cycle brought back the most valuable resource to our facility – record numbers of users (Fig. 14)! Although two of the primary user facilities, WNR and pRad, have been operating regularly, the Lujan Center had not had a full run cycle since shutting down in August 1997 for major upgrades. This year marked the first full run cycle for the Lujan Center. Users returned in record numbers, with 64% being first-time users, 26% under age 30, and 73% coming from outside LANL (Fig. 15). The WNR Facility also saw a record number of user visits, almost double since the 1997 run cycle, with 80% coming from outside LANL (Fig. 16).

The Voice of the Users

Collecting information on user satisfaction is important and useful in addressing issues and giving

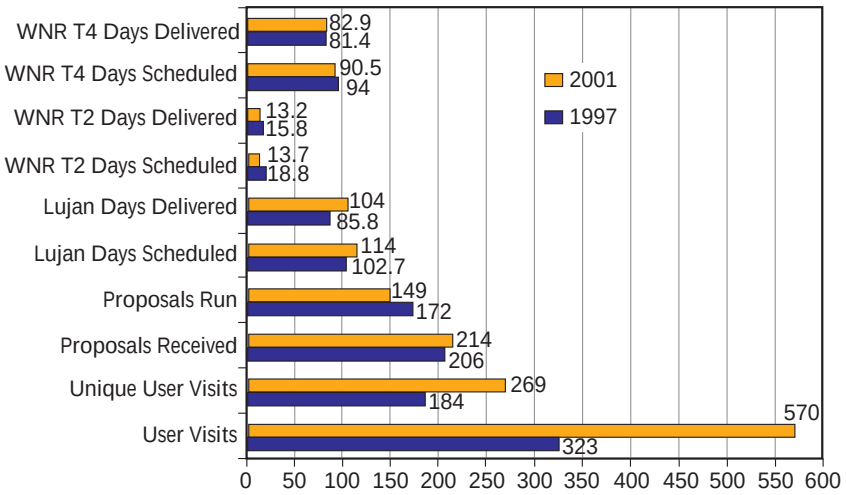


	1995	1996	1997	1998	1999	2000	2001
Users	121	187	163	9	50	47	270
Unique User Visits	57	72	90	9	20	42	150
Experiments Run	67	89	128	9	20	22	113
Proposals Received	151	151	155	177	N/A	N/A	166



	1995	1996	1997	1998	1999	2000	2001
Users	114	146	107	142	141	129	300
Unique User Visits	*	*	43	36	53	75	119
Experiments Run	25	28	32	27	22	32	36
Proposals Received	28	33	46	55	N/A	46	48

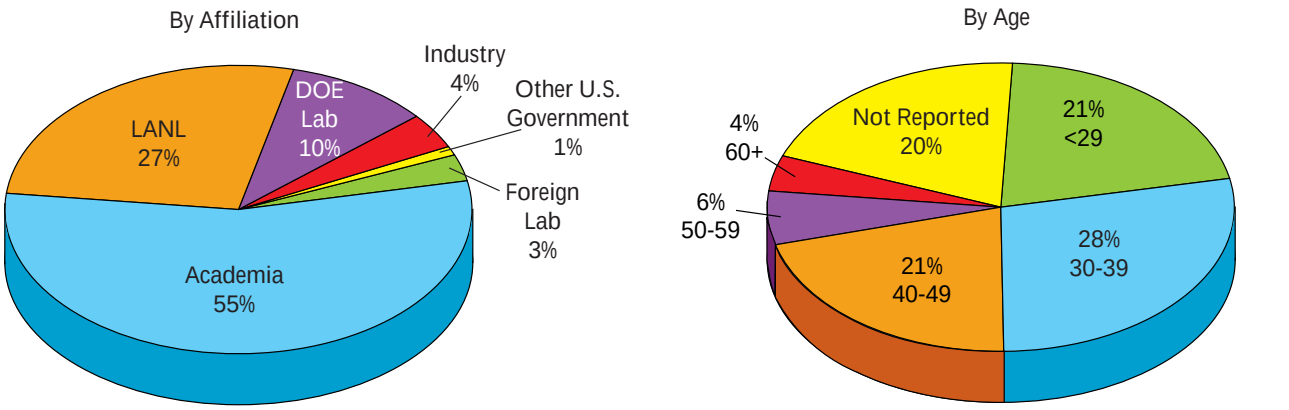
↑ ***Fig. 11.*** *Calendar year user and proposal statistics. "Unique user visits" counts each user only once, regardless of the number of visits or experiments conducted during the run cycle. Users include all users on the experimental team coming to LANSCE or sending in samples to be run by a local contact.*



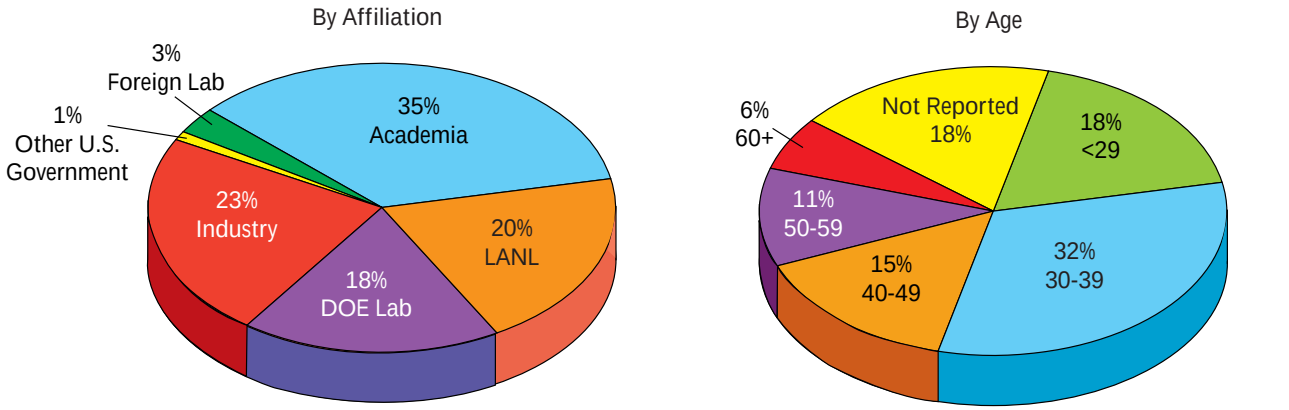
↑ ***Fig. 12.*** *Comparison of the 1997 versus 2001 run cycle for WNR and the Lujan Center.*

↑ ***Fig. 13.*** *User Office staff include Sandy Booth, Database Administrator (bottom); Evan Sanchez, Direct User Support (left); and Gail Roach, Reception and User Processing (right). The staff also receives valuable assistance from their part-time undergraduate student, Rebecca Garcia (not pictured).*

↑ ***Fig. 14.*** *Tonya Kuhl of the University of California at Davis explains how the Neutron Confinement Shear Cell (the apparatus pictured to her left) is helping scientists understand what happens when polymer layers are brought together.*



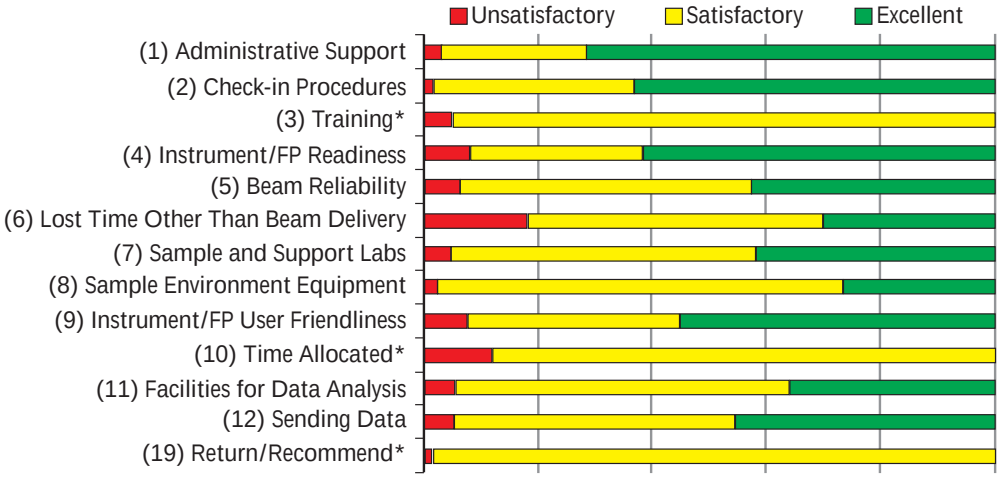
↑ ***Fig. 15.*** *2001 Lujan Center "unique" user distribution by affiliation and age. A "unique" user means that each user is counted only once, regardless of the number of visits and/or experiments conducted during the run cycle.*



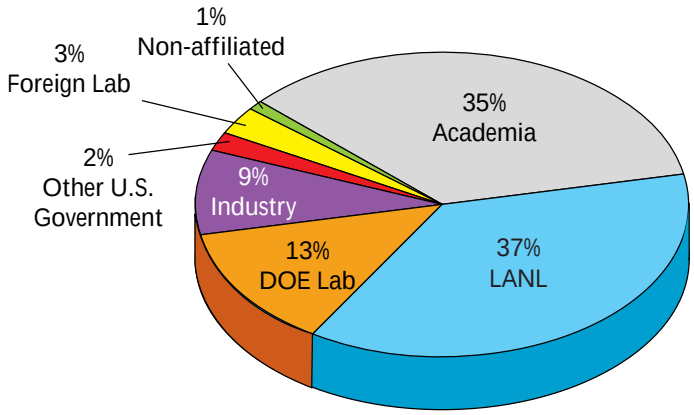
↑ ***Fig. 16.*** *2001 WNR "unique" user distribution by affiliation and age. A "unique" user means that each user is counted only once, regardless of the number of visits and/or experiments conducted during the run cycle.*

"pats on the back," prioritizing, and allocating resources for the user program. Each user receives a 19-question User Satisfaction Survey at check-in, which covers aspects of administrative and technical support, beam reliability, instrument and equipment, data collection and analysis, and user amenities. Survey results from 2001 are shown in Fig. 17. In addition, free-form comments provide even more valuable information that is used to improve the user program in future run cycles.

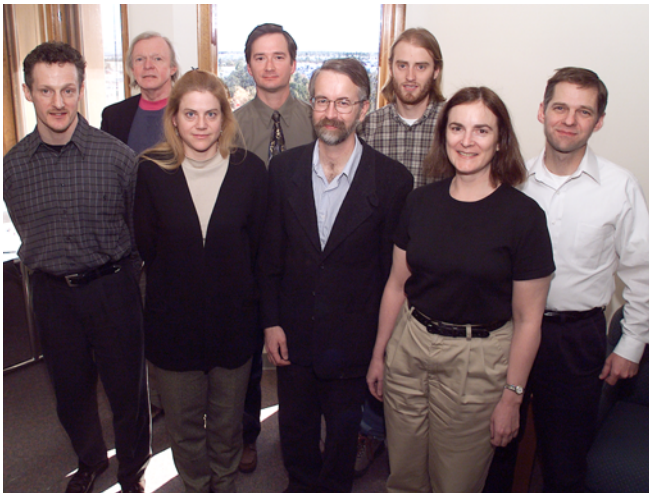
Another “voice” for the users was established in 1996. The LUG provides users and potential users the opportunity to influence the way in which the facility is managed and improved. Unlike other national user facilities, biennial renewal of membership is required to maintain active status to ensure we hear primarily from active users. As of December 2001, the LUG membership was 393 strong, with users from across a diverse spectrum (Fig. 18). The LUG is represented by an 11-member Executive Committee (ExecCom). ExecCom (Fig. 19) membership is structured to represent the principal activities at LANSCE: neutron scattering, defense-related research, industry, and nuclear physics and technology, plus one graduate student or postdoctoral fellow in any of these disciplines holding a one-year term. The ExecCom holds monthly conference calls and meets at LANSCE on a quarterly basis to work on a variety of issues, including communicating with LANSCE’s sponsors, providing input on the Spectrometer Development Project, funding and scheduling issues, and organizing the user meeting.



↑ ***Fig. 17.*** *User Satisfaction Survey results from 2001 run cycle. Questions marked with an asterisk allow only a negative or positive response. The one negative response on the return/recommend question was only relative to the use of flight path (FP) 5, which was not supported in 2001 as part of the Lujan Center user program and was run with minimal user support. Freeform comments indicate overall satisfaction with the beam conditions, praise for the valuable staff support, aging computer facilities/equipment, and a strong need for better accommodations and dining options in the Los Alamos area.*



↑ ***Fig. 18.*** *LUG membership distribution by affiliation as of December 2001.*



← ***Fig. 19.*** *The 2001 LANSCE User Group ExecCom is elected by the LUG each October, with members holding two-year terms. Shown from back, left to right are David Bowman, Los Alamos National Laboratory; Michael Kent, Sandia National Laboratories; and Andrew Christianson, Colorado State University. Front, left to right: Chris Durning, Columbia University (past Chair); Shenda Baker, Harvey Mudd College (Vice-chair); Brent Fultz, California Institute of Technology; Laurie Waters, Los Alamos National Laboratory; and Ward Beyermann, University of California at Riverside (Chair). Not pictured are Brent Heuser, University of Illinois; Mary Hockaday, Los Alamos National Laboratory; and David Londono, DuPont Central R&D.*

LANSCE User Group Meeting

User meetings are organized by the LUG ExecCom to bring together current and potential users of LANSCE to share recent scientific discoveries and to discuss instrumentation upgrades and other changes that could enhance scientific output. Student participation is encouraged through travel support, reduced registration fees, and student poster prizes.

The Fifth LANSCE User Group Meeting was held August 12-14, 2001, with about 135 attendees representing 35 different academic institutions, research laboratories, and industry. The meeting opened with two workshops: Science Planning for the Lujan Center, which was standing-room only, and Materials Research for High Power Accelerator Applications. On the second day, presentations reflected four of the distinct research areas at LANSCE: neutron scattering, nuclear physics, pRad, and accelerator science and technology. Plenary talks covered future opportunities for U.S. neutron sources and an overview of the European Spallation Source project.

A special 20th birthday celebration was held in honor of the Filter Difference Spectrometer (FDS). Peter Vordervich (Hans-Meitner-Institut) came to the Lujan Center in 1985 (Fig. 20) to work on the development of FDS, one of the oldest neutron scattering instruments at a spallation source still in service. He delighted attendees with stories from the early days when there were "no neutrons but plenty of time for instrumentation" and took us back to a time when the "electronics [were] not able to handle the count rate."

The meeting ended with a festive banquet in Santa Fe at the Eldorado Hotel, with its distinct southwest style. Juergen Eckert, who had just flown in that afternoon from Germany, was presented with the Second LANSCE Director's Award for Scientific Excellence. Juergen Eckert was nominated by members of the LUG for pioneering the application of inelastic neutron scattering to the study of difficult problems of interest to inorganic and organometallic chemists, among a long list of other technical accomplishments. Prizes for the top three student posters were also presented. This year, Tushar Choudhary of Texas A&M University received first prize for his submission titled, "A Neutron Vibrational Study of Methane Activation on Supported Metal Catalysts." Alan Brothers and Jay Hanan, both of the California Institute of Technology, received the runner-up prizes for "Solid-State Reaction Kinetics Using Neutron Scattering" and "Strain Evolution in an Aluminum-Alumina Composite During Cyclic Loading and Fiber Failure," respectively. Georgia Strickfaden, Los Alamos Historical Society, finished the evening with an entertaining historical perspective on "The Mesas Before Meson." (The LANSCE predecessor facility, the Los Alamos Meson Physics Facility was commonly referred to as "Meson," and LANSCE sits atop one of New Mexico's many breathtaking mesas.)

↑ ***Fig. 20.*** *Peter Vordervich came to LANSCE in 1985 to work on the development of the FDS (left). At the 2001 user meeting, he entertained attendees with stories from the "good old days" (right).*

A Message from the Chair

Ward Beyermann, University of California at Riverside
2001 LANSCE User Group Executive Committee Chair

In comparison to other user facilities, LANSCE is a complex operation. Not only is the scope of activities very broad involving a technically diverse community, but also support for these activities comes from more than one sponsor, each with a different mission. Past performance has resulted in many disheartened users. During the last few years in response to this situation, big changes have occurred at LANSCE. Throughout this time, input from the LUG Executive Committee, as a representative of the users, was frequently solicited. John Browne, the Laboratory Director, has placed the successful operation of LANSCE as the Laboratory's highest priority with the intent on making it a flagship facility for the Laboratory. One of the most significant events was a restructuring of DOE, LANL, and LANSCE management to better align budget and administrative authorities. This should provide single-point accountability between LANSCE and its sponsors. Along with placing the LANSCE Division in a new Directorate, Paul Lisowski was named as the new director of LANSCE, Alan Hurd was appointed group leader of the Lujan Center, and a new group was formed to provide user services, headed by Audrey Archuleta.

With the close of 2001, there is now ample evidence that the situation is much improved. The outage at the beginning of the year was well planned and completed 24 days ahead of schedule. The user program promptly started on July 1, 2001, and continued smoothly for the scheduled 6-month period. A record number of users visited the facility and reported a very positive experience in the exit surveys. The only major disruption was an unforeseeable failure of the target cooling system that forced the Lujan Center to operate for most of the cycle at 55% of the intended current. Fortunately, the reduced flux did not impact the experimental program according to the exit surveys. Among the indicators of success were the high-beam-availability figures. With a beam availability of 91.4%, the Lujan Center was comparable to the best spallation source in the world. WNR and pRad were even higher with 91.6% and 94%, respectively.

New facilities have also appeared on the mesa. A new experimental enclosure for the single-event upset facility at WNR was inaugurated. In comparison to 1997 (the last full run cycle), there has been a dramatic increase in the instrumentation at the Lujan Center. HIPPO, SMARTS, and the Protein Crystallography Station, which were constructed with funds from DOE, are now commissioned and will enter the user program in the next run cycle. With an investment of institutional and National Science Foundation support, Asterix and PHAROS are now operating, and a major upgrade for the NPD is under way.

Overall, there is little doubt that last year was productive. This resulted from a devoted commitment and hard work by the management and staff of LANSCE. It is also clear to many of us that this achievement relied heavily on the important investments in infrastructure and regulatory procedures by the previous management under Roger Pynn.

Is last year's success the beginning of a lasting trend? There is still a serious imbalance between the expected level of activity and the resources in both personnel and equipment needed to support this activity for the long term. This was confirmed by comprehensive cost review of the facility, which was externally verified. A significant increase in funding is needed from the LANSCE sponsors to correct this imbalance. Otherwise, LANSCE will remain vulnerable to past infirmity, and moving from a reactive to a proactive maintenance strategy will be difficult. Obtaining this support is the biggest challenge that LANL and LANSCE management face.

Work is now under way on two major programs that will affect different segments of the LANSCE user community in the coming decade. The first is the Stockpile Stewardship mission where LANSCE plays an important role in providing fundamental information for the certification process of the nuclear arsenal. The second program is the construction of the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory, which will greatly increase our country's capacity to do neutron scattering. The Lujan Center can help build the user community that will take advantage of this increased capacity, and if the full potential of the Lujan Center is realized, past experience has demonstrated that its scientific output will remain important long after the completion of the SNS.

In closing, I am optimistic and see a bright future for LANSCE. I want to thank the LANSCE management and staff and the other members of the LUG ExecCom for their valued assistance, and most of all, it has been an honor serving the users as Chair of the LUG.

Scenes from the Fifth LANSCE User Group Meeting

↑ *This year's student poster prize winners pose with Andy Christianson, the ExecCom student representative (far left) and Ward Beyermann, the Chair of the ExecCom (far right) following the presentation of prizes. First prize, a check for $50, went to Tushar Choudhary, Texas A&M University (second from right). Runners-up Geoff Swift and Alan Brothers are shown second and third from the left, both from the California Institute of Technology. Geoff Swift accepted the award (silver coins donated by Academy Precision Materials) on behalf of Jay Hanan, also of the California Institute of Technology.*

↑ *James Van Fleet, Acting Director for the Office of Defense Programs, delivers the welcoming speech from the National Nuclear Security Administration.*

↑ *Director's Award recipient, Juergen Eckert, receives a congratulatory handshake from LANL Fellow, Gregory Kubas, following the presentation of this award for sustained scientific excellence. Kubas' supporting letter considered Eckert's research to be "not only novel but . . . a rare example of bridging the gap between physics and chemistry."*

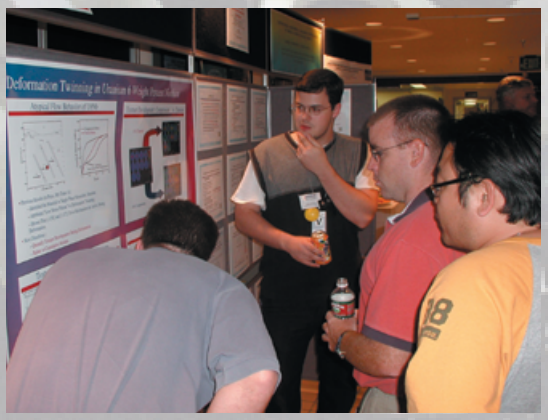
↑ *The 18th Louis Rosen Prize was awarded to Michael Manley (center). Manley earned his doctorate degree in materials science from the California Institute of Technology in May 2001. Also shown are (left) Professor Shenda Baker (Harvey Mudd College), LUG Vice Chair, and (right) Paul Lisowski, LANSCE Director.*

↑ *LANSCE Director Paul Lisowski presents a $2,000 check to Juergen Eckert of the Lujan Center as the recipient of the Second Director's Award for Scientific Excellence. Juergen also received a cake featuring a schematic drawing of the FDS. He gave no indication as to which of the two he preferred.*

↑ *Peter Vordervich (HMI), Luc Daemen (Lujan Center), and Joyce Roberts (LANSCE Division) join together in cutting the FDS's 20th birthday cake. Vordervich and Roberts (then a post-doc) worked on the development and construction of FDS. Daemen is the current instrument responsible filling in for Juergen Eckert who was on sabbatical at the University of California at Santa Barbara.*

↑ *Participants at the 2001 LUG meeting take advantage of the lunch break to swap information and maybe get some work done.*

↑ *Gian Felcher (Argonne National Laboratory) and Peter Vordervich (HMI) linger long after the plenary session to engage in a more detailed technical discussion.*



↑ *Alan Brothers (California Institute of Technology), Don Brown (LANL), and Kazunari Maeda (New Mexico State University) share information during the poster session and reception.*

↑ *From left, Mike Manley (LANL), Heinz Nakotte (New Mexico State University/LANSCE), student attendees Sung Chana and Kazunari Maeda, and LUG student representative Andy Christianson (University of Colorado) meet during a break.*